toward the mountain, combined with the general wind then prevailing.

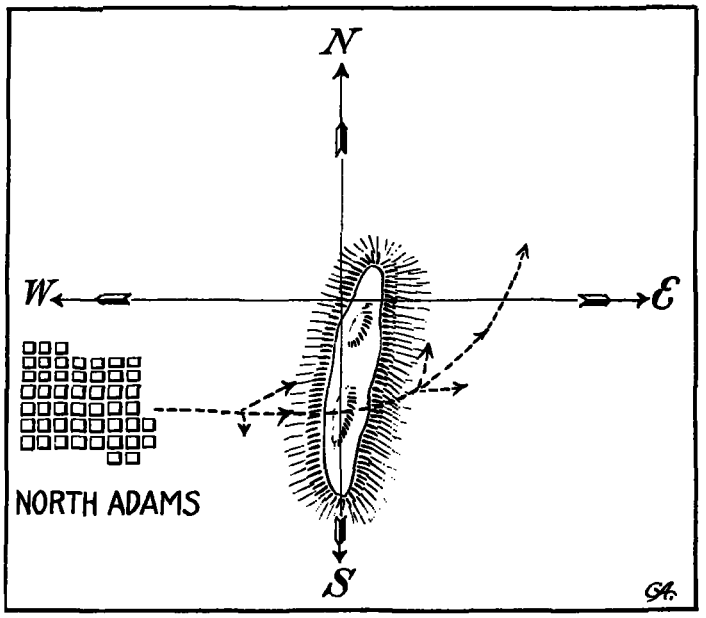

FIG. 2.—Diagram of the path of the balloon from North Adams, Mass., across Hoosac Mountain, July 29, 1908.

Between the Hoosac Mountains and North Adams, there is drawn a heavy arrow along the track, and on either side of the heavy arrow are drawn other arrows, the longer one showing the prevailing wind, the shorter showing the wind caused by the heated air flowing up the sides of the mountain. The flight of the balloon was the resultant of these two winds.

On the east side of the mountain a similar heavy arrow is drawn and the prevailing winds shown in the same way. So that the track of the balloon was directly toward the east on the west side of the mountain, but turned toward the northeast on the eastern side.

Noting the short arrows, which are intended to represent the local component of the wind under the influence of the mountain, it is seen that the wind tended to flow round and up the mountain slopes in the same way that air flows round and into a center of low pressure. And just as clouds and showers are found round the central area of a low pressure, so clouds were found round the summit of the mountain.

ASCENDING AND DESCENDING CURRENTS.

Messrs. Stevens, Hawley, and Van Sicle, who ascended at Dalton, Mass., earlier in the day, were drawn into one of these massive clouds found about the mountain, and there encountered a tremendous ascending current that carried them upward with frightful speed to 8,000 or 9,000 feet, after which, having lost much gas, they descended very rapidly.

Such experiences, however, are not rare. Several aeronauts, including Wise in America and Captain Goss in Germany, have related similar experiences in which the attendant phenomena were even more violent than those related by Mr. Stevens. In no case, however, has the aeronaut suffered any injury. Even if all the gas were driven out of his balloon, as was the case with Wise, the bag would act as a parachute and land the aeronaut without serious damage.

A mountainous region is not as favorable as level country for long voyages in balloons, because the ascending currents which prevail there cause the balloon to lose much gas. In taking a pleasure voyage over such a country, it is usually necessary to pass above the ridge of the mountain, and in doing so the balloon necessarily loses gas, even if the current ascending the side of the mountain is not strong. Immediately after the ridge is past, the balloon, no longer supported by the current, falls by its own weight and is further aided by descending currents which probably prevail on the leeward side of the mountain. This effect causes the aeronaut to lose his extra ballast rapidly and makes it difficult to float at a uniform height, which is the desideratum in ballooning. As opposed to the ascending currents of air, which are found over mountains, balloonists find that there are strong descending currents of air over cool portions of the earth's surface, like lakes and dense forests. A balloonist in Switzerland tells of being drawn down to the surface of a lake and held there by the descending current so that he was unable to rise again.

The following table, Table 1, presents the result of the records kept by Mr. Clayton on this ascent at North Adams:

TABLE 1.—*Meteorological observations by H. H. Clayton in balloon ascent with Charles J. Glidden on July 29, 1908.*

Time. 75th meridian.	Altitude of balloon above sea level.		Temperature.		Relative Humidity.	Wind.	
						Direction.	Velocity.
	Meters.	*Feet.*	°*C.*	°*F.*	*Per cent.*		*Mi. p. h.*
4:35 p. m.	240	787	29.1	84.4	58	w.	5
4:44 p. m.	500	1640	26.7	80.1	64	w.	6
5:00 p. m.	1000	3281	22.4	72.3	76	w.	7
5:13 p. m.	1500	4921	18.5	65.3	91	w.	7
5:15 p. m.	1560	5118	18.0	64.4	93	wsw.	7

Remarks.—The balloon left the ground at 4:35 p. m.; 5:09 p. m. among clouds; 5:12 p. m. a glory, two colored rings, was observed about the shadow of the balloon; 5:15 p. m. passing thru a cumulus cloud. Wind changed from W to WSW at 1,500 meters when crossing Hoosac Mountains and was from SW about 5 miles an hour on landing in W. Monroe, six miles ENE of North Adams. The sky was clear during the flight except for a few cumulus clouds over the mountain.

THE SECOND VOYAGE.

On September 10, 1908, Messrs. Clayton and Glidden made a more extended voyage, this time from Springfield, Mass. They remained in the air nearly five hours, from 0:38 to 5:23 a. m. and traveled from Springfield to Bridgewater, Mass. Table 2 gives some of the results of their observations during this trip.

TABLE 2.—*Observations during balloon voyage by Charles J. Glidden and H. H. Clayton, September 10, 1908, from Springfield, Mass., to Bridgewater, Mass.*

Place.	Time, 75th meridian.	Distance.	Velocity.	Traveling toward—	Height.	Temperature.
	a. m.	*Miles.*	*Mi. p. h.*		*Feet.*	°*F.*
Springfield	0:38	.....	.....	.....	125	59
Chicopee River	1:04	5	11.5	ne.	900	57
Central Massachusetts R. R.	1:48	9	12.3	ne.	1,000	50
Ware	2:30	7.5	10.7	ese.	1,500	60
North Brookfield	2:55	7.5	18.0	ese.	1,500	57
Worcester reservoir	3:18	8.5	22.2	e.	1,400	.....
Worcester	3:30	4.5	22.5	.....	.....	.....
Millbury	3:35	3	36.0	se.	3,000	60
North Pond	3:53	9	30.0	se.	3,000	.....
Milford	4:08	4	16.0	ese	1,500	.....
Neponset reservoir	4:45	14	22.7	.....	.....	.....
East Foxboro	4:51	2.5	25.0	e.	800	.....
Easton	5:04	5	23.3	e.	600	53
Bridgewater	5:23	7	22.1	e.	.....	.....
Total	.....	86.5				
Mean in four hours	.....	45	18.0	e.	.....	.....

Straight line distance = 82 miles.

THE METEOROLOGICAL WORK OF THE UNIVERSITY OF JURJEV (DORPAT), RUSSIA.

By ELMAR ROSENTHAL. Dated Tiflis, September 21, 1908.

The Meteorological Observatory connected with the University of Jurjev (Dorpat), has recently issued a volume of memoirs written by students of the university. The work was planned and supervised by Prof. B. I. Sresnevsky, Director of the observatory. The memoirs are written in Russian and followed by brief abstracts in German. The following gives a short account of these papers.

Agrinsky.—*The relation between rainfall and the fluctuations in level of the Embach.*

Records of twenty-six rain-gage stations distributed over the drainage basin of the little river Embach are used. The level of the river shows very distinctly the influence of the precipitation, every rainfall producing a well-defined fluctuation in the height of the stream. Heavy rains of short duration are of less influence than rainy periods of several days. But all such fluctuations are of minor importance in comparison with the great annual period peculiar to most of the Russian rivers. After the melting of the snow in the early spring the level of the river rises rapidly, reaching its maximum height within less than two weeks after the first rise. The water level then decreases slowly to the mean level of early spring, which it attains only at the end of summer, and reaches its minimum at the end of September. The fluctuations produced by the rainfall do not entirely mask this general period. A small secondary maximum in the late autumn is caused by the precipitation of this season.

Vinogradov.—*The relation between barometric gradient and wind velocity near Jurjev (Dorpat).*

The observations at three stations near Jurjev furnish the data for calculating the relation between the wind velocity and the pressure gradient. Direct computation does not reveal an accurate relation between these elements. The author finds that with the gradient as argument, a velocity of 1 to 2 meters per second belongs to a zero gradient. Inversely, using the wind-force as argument, he finds for the velocity 0 a gradient of 0.6, 0.7, or 0.8. The difficulty disappears if one calculates the frequency of both elements and compares gradient and velocity for equal frequencies. Then an exact relation is found to exist, both elements become 0 for the same frequency and increase in a constant ratio. This method was suggested by Prof. B. I. Sresnevsky about twenty years ago. Further details will be found in the original paper.

Pokrovsky.—*European cyclone tracks for 1890–93.*

This is a revision of an earlier paper by Mr. Rybkin. As that author had employed methods differing somewhat from the usual ones, and his results did not fully agree with other investigations, a recalculation seemed desirable. The method now employed is the same as that of Professor Sresnevsky in his earlier works on cyclone tracks, and the results are in full agreement with this author. The mean direction of the tracks is ENE. The velocity of winter cyclones diminishes, while that of summer cyclones increases within the limits of Europe. In general, the tracks are curves concave toward the north. Summer cyclones become stronger during their passage over Europe, while winter cyclones diminish in intensity. The mean velocity is about 33 kilometers per hour.

Meyer.—*Some experiments with hair hygrometers.*

The influence of pressure was investigated and found to be inappreciable. No variation of the hygrometer reading (within 1 per cent) could be found when the pressure varied from 50 millimeters to 760 millimeters. Further experiments were made in order to study the variations caused by ether vapor introduced into the constant humidity chamber. When the humidity is diminishing the hair of the hygrometer contracts. The theory of the hair hygrometer by Professor Sresnevsky explains this contraction by the action of the surface tension of little water bubbles included in the capillary canal of the hair. The ether vapor tends to diminish the surface tension, and, therefore, should cause a lengthening of the hair. This was indeed observed, but the lengthening did not reach the calculated value. It is to be hoped that further investigations will explain the discrepancy.

Radetzky and Sresnevsky.—*The arrangement of cirrus clouds.*

The purpose of this investigation was to determine whether the observation of cirrus radiant could give any valuable scientific result or not. There is a well known hypothesis that the bands or stripes of feeble cirri radiate from the cloudy area of a cyclone. The investigation shows, however, that this assumption is not well founded. The authors failed to establish any relation between the directions of the cirri and the isobars. But another result of interest was obtained. In many cases the direction of the cirri was shown to be nearly identical. Thirty per cent showed nonparallelism over the vast area of European Russia. A marked parallelism in arrangement was established for 40 per cent of all cases, and the remaining cases were doubtful. It should be added that the observations available for this investigation were not of a quality desirable for scientific study, the casual observers being not sufficiently familiar with the methods of cloud observing, and the observations being incidental rather than of intention. Further investigations, therefore, would be interesting and desirable.

Kharshan.—*The diurnal and annual periods of the humidity at Jurjev (Dorpat).*

The annual rate was determined from observations extending thru 35 years. We give here the result for the average relative humidity only. January, 89.8; February, 86.8; March, 83.9; April, 75.9. May, 69.2; June, 69.7; July, 73.2; August, 78.6; September, 83.9; October, 87.5; November, 91.0; December, 90.6 per cent. The diurnal rate was determined for each month separately from automatic records for the year 1897 only. This latter part of the investigation will be continued.

Kurrik.—*Sensitometer observations during the years 1902–1906.*

An improved Scheiner's sensitometer, as described by Andresen in the "Annales de l'observatoire météorologique du Mont Blanc" for 1900, was used. The instrument was sheltered from the diffused sky light by a long tube; "Ilford" photographic paper was used. After reducing the observations to equal thickness of the atmosphere, its transparency was found to be a little less during the summer and somewhat greater during the winter than that found by Andresen. It was found that the atmospheric water vapor was of great influence. Let e be the vapor tension, then the absorption coefficient is given by the formula:

$$\text{coeff.} = 0.148 \pm 0.007 + 0.015\, e \pm 0.002\, e,$$

where the probable error is very small. It follows from these considerations, that the magnitudes of stars, when determined by measurements of photographic plates, need a correction due to the vapor tension prevailing during the exposure.

Detishchev.—*Cold waves during the years 1901–1904.*

Cold waves are unknown in western Europe, but they are very common in the interior of large continents such as North America and in Russia. In the latter country the existence of such waves was first detected by Professor Sresnevsky. In many cases the propagation of these waves is so rapid, that a study of the mean daily temperature is often insufficient to detect them. The investigation may be founded on three different characteristic values, which give in general somewhat different results, namely, 1. On a particular daily thermometer reading, for instance at the morning observation; 2. On the monthly minimum temperature, which is published in the international summaries for every station and is thus available for studying the most important cold waves in regions for which daily observations are not published; 3. On the greatest monthly departure of the daily means from the monthly mean.

The present investigation is based on the morning temperature and a full list of the cold waves for 1901–1904 is presented. An abstract of an earlier paper by Professor Sresnevsky, embracing the years 1890–1900 is added. As a general rule the

cold waves appear first in the region northeast of Lake Onega. The wave then moves, in general, southeastward with a velocity of 600 or 700 kilometers per day, forming a long curved band. In most cases the wave finishes in the southeastern part of European Russia, but some could be traced as far as India and the coast of the Pacific Ocean. Professor Sresnevsky adds some theoretical remarks on the mechanics of these cold waves, for which the reader should consult the original German abstract.

PRIZE OFFERED BY THE GERMAN METEOROLOGICAL SOCIETY.

Dated Berlin, October, 1908.

At the request of Prof. G. Hellman, President of the German Meteorological Society, we publish the following announcement, at the same time expressing the hope that many observers will feel impelled to enter the competition. It is true that the research corps at Mount Weather, Va., are in the most favorable position to compete, but there are available in this country, several sets of the published results of the International Commission for Scientific Aeronautics, and the Editor will gladly do all that he can to aid any of our men in the preparation of a creditable essay in this competition.

Preisausschreiben der Deutschen Meteorologischen Gesellschaft.

Die Deutsche Meteorologische Gesellschaft schreibt einen Preis von 3000 (drei Tausend) Mark aus für die beste Bearbeitung der bei den internationalen Aufstiegen gewonnenen meteorologischen Beobachtungen, soweit sie veröffentlicht vorliegen.

Bedingungen.

1. Es steht den Preisrichtern frei, geeignetenfalls den Preis zu teilen.
2. An der Preisbewerbung können sich Angehörige aller Nationen beteiligen.
3. Die anonym einzureichenden Bewerbungsschriften sind in deutscher, englischer oder französischer Sprache zu verfassen, müssen einseitig und gut lesbar geschrieben, ferner mit einem Motto versehen und von einem versiegelten Umschlag begleitet sein, der auf der Aussenseite dasselbe Motto trägt und inwendig den Namen und Wohnort des Verfassers angibt.
4. Die Zeit der Eisendung endet mit dem 31. Dezember 1911, und die Zusendung ist an den unterzeichneten Vorsitzenden der Gesellschaft (Geheimen Regierungsrat Professor Dr. G. Hellmann, Berlin W. 56, Schinkelplatz 6) zu richten.
5. Die Resultate der Prüfung der eingegangenen Schriften durch fünf Preisrichter werden 1912 in der Meteorologischen Zeitschrift bekannt gegeben werden.

Der Vorsitzende der Deutschen Meteorologischen Gesellschaft.

Hellmann.

Translation.

The German Meteorological Society offers a prize of three thousand marks (M. 3,000) for the best discussion of the published observations secured on the dates of the International Ascents [with kites, sounding balloons, and manned balloons].

CONDITIONS.

1. The judges reserve the right to divide the amount of the prize among two or more contestants, if they feel justified in so doing.
2. Contestants may be of any nationality.
3. The essays or memoirs submitted in competition may be written in German, English, or French. The manuscript must be legibly written, on one side of the sheet only, and signed with an anonymous motto. The paper must be accompanied by a sealed envelop bearing the motto on the outside, and containing a slip of paper with the name and residence of the competitor.
4. The competition will close December 31, 1911. The manuscripts should be sent [by registered mail] to the following address:

Geheime Regierungsrat Professor Dr. G. Hellman,
Schinkelplatz 6, Berlin, W. 56., Germany.

5. The memoirs submitted will be examined by five judges and their decision will be announced during 1912 in the pages of the Meteorologische Zeitschrift.

Signed: Hellmann,
President German Meterological Society.

A CALIFORNIA CLOUDBURST.

By J. S. DOUGLAS, San Emigdio Rancho, Kern Co., California.
[U. S. Geological Survey Press Bulletin, October 12, 1908.]

In the upper reaches of San Emigdio Canyon, Kern County, Cal., cloudbursts have at many places stript the mountain slopes bare of their forest cover and swept great trees and masses of rock many miles from their source. Just where the creek breaks from the hills is the hacienda of San Emigdio Rancho, and the superintendent of the rancho, J. S. Douglas, who has had ample opportunity to observe the cloudbursts, gave the following description to H. R. Johnson, of the United States Geological Survey.

The cloudburst * * * issued from Cloudburst Canyon into San Emigdio Canyon about 8 miles above this ranch house. I had been expecting the occurrence, as the premonitory signs had been very pronounced for two or three days previously, viz, immense masses of white snowy clouds in the forenoons, changing in color to inky blackness in the afternoons, with the accompaniment of thunder. The weather was sultry, with occasional gusts of cool wind rushing *down* the canyon, an unusual occurrence during the day in summer time.

Some time before [the wave of mud and water] made its appearance, probably fifteen minutes, its dull and heavy roar could be heard from up the canyon, quite distinct from and rising above all the other noises of the storm and reminding me of breakers against a rocky shore. As it issued from the narrow mouth of Cloudburst Canyon into the comparatively broad one of San Emigdio, it was accompanied by a cloud of dust occasioned by the breaking up of huge masses of dry soil torn from projecting points in its rush down the canyon.

Through the dust glimpses would be had of great piles of drift with an occasional tree turning end over end * * *.

After reaching the main canyon it spread to a width of probably 200 yards, and after descending about one-half mile came to a full stop, only to be succeeded in a few moments by another wave larger and swifter than the first. There was no dust about this or any of the succeeding waves, but immense masses of rock, many of which must have weighed several tons, were apparently dancing along, light as corks on the surface, being supported by the rocky mass beneath.

This wave extended about one-half mile farther down the canyon than the first, when it also came to a stop, having spread to the full width of the canyon (about one-fourth mile here).

In a few moments another wave of mud swept by, followed by others at intervals of a few minutes, each succeeding wave getting thinner and traveling with greater velocity than the preceding ones, until finally in about half an hour it was mud no longer, but a steady rush of a yellow foaming torrent, at first probably 100 yards wide in the main canyon, gradually reducing its width and increasing its depth and swiftness as it washed out a channel in the soft mud.

In answer to your question as to the distance and size of rocks moved by cloudbursts, I will give you a description of one which lies on the bank of the creek close to this house. It is a sandstone bowlder which has come from 7 miles above and as near as it can be measured, owing to its irregular shape, gives the following dimensions: Height 8 feet, length 16 feet, width 12 feet. On the plains (the San Joaquin Valley) about 5 miles east of here, in sec. 22, T. 11 N., R. 21 W., several masses much larger than this can be seen. These were brought down the Pleito Canyon by cloudbursts.

Commenting on this description Mr. Johnson says:

The interesting point about the cloudburst described above is its ebb and swing. It has been further learned that the first wave which brings down the coarsest débris often forms a dam at or near the canyon's entrance. It is as a result of the impact between the later waves and